

REMARKS

This paper is responsive to a Non-Final Office Action dated November 9, 2004. Claims 1-30 were examined. The specification is objected to for reserving blank space for an application number on page 17. Claims 1-17, 27, and 30 stand rejected under 35 U.S.C. § 112, second paragraph. Claims 1, 7, 8, 11, 14, 16, 18, 25-27, 29, and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,550,815 to Cloonan et al. Claims 2, 3, 6, 9, 10, 15, and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 6,115,373 to Lea. Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 5,821,875 to Lee et al. Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan and Lea. Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan. Claims 13, 21, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 3,676,846 to Busch. Claim 20 is objected to as being dependent upon a rejected base claim.

Objections to the Specification

The specification is objected to for reserving blank space for an application number on page 17. The specification is amended to include an application number. Accordingly, Applicants respectfully request that the objection to the specification be withdrawn.

Claim Rejections Under 35 U.S.C. § 112, second paragraph

Claims 1-17, 27, and 30 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Regarding claims 1, 14, and 30, the Office Action states that the “claims limitation ‘forwarding packets with a fixed (forwarding) rate’ is unclear, because it is not understood what rate is fixed: the rate of packet transmission through the buffer less switch from an input port to the output port or the rate of packets transmission from the output port of the switch.” Applicants respectfully maintain that the language of claim 1 clearly states that the forwarding rate of packet transmission through the buffer-less switch is fixed. Applicants respectfully maintain that the language of claim 14 clearly states forwarding packets at a fixed rate from respective input ports through the switch to respective output ports. Applicants

respectfully maintain that the language of claim 30 clearly states forwarding packets at a fixed rate from respective input ports through a switch to respective output ports. Accordingly, Applicants respectfully request that the rejection of claims 1, 14, and 30, and all claims dependent thereon, be withdrawn.

Regarding claim 11, the Office Action states that the “claims limitation ‘no buffer space is allocated in a receiving node before a packet is sent’ is unclear, because it is not understood where is [sic] the packet is sent from: a transmission node or the switch output port.” Claim 11 is amended to recite that a packet is sent from a respective sending node. Accordingly, Applicants respectfully request that the rejection of claim 11 and all claims dependent thereon, be withdrawn.

Regarding claim 27, the Office Action states that the “claim limitation ‘output registers in the buffer-less switch coupled to receive data selected by respective selector circuits selectively coupled to respective ones of the input ports’ is confusing and could not be understood as written.” Applicants respectfully point the Examiner to FIG. 10, for example, which illustrates output registers 1030 and 1032 in buffer-less switch 1010. Buffer-less switch 1010 is coupled to receive data selected by respective selector circuits 1026 and 1028, which are selectively coupled to respective ones of the input ports. Applicants respectfully maintain that the functional language of claim 27 (“...coupled to receive...”) serves to set definite boundaries on the patent protection sought for the claimed method, and thus complies with 35 U.S.C. § 112, second paragraph. See MPEP § 2173.05(g). Accordingly, Applicants respectfully request that the rejection of claim 27 and all claims dependent thereon, be withdrawn.

Claim Rejections Under 35 U.S.C. § 102(e)

Claims 1, 7, 8, 11, 14, 16, 18, 25-27, 29, and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,550,815 to Cloonan et al. Regarding claim 1, Applicants respectfully maintain that Cloonan, alone or in combination with other references of record, fails to teach or suggest

forwarding all packets that are successfully delivered
through output ports of the buffer-less switch to the

receiving nodes, through the buffer-less switch with a
fixed forwarding rate,

as recited by claim 1. The Office Action relies on FIG. 1, and col. 1, lines 60-65 to supply this teaching. These portions of Cloonan teach packet switch 100, which includes interface cards 106, and output packet modules 104. Cloonan states that “[e]ach of the output packet modules 104 includes memory devices which are used to buffer the cells in order to alleviate problems associated with multiple cells destined for the same output line at the same time.” (Col. 1, line 65-col. 2, line 2) The growable packet switches taught by Cloonan include output modules having a FIFO (col. 18, lines 1-2).

The Office Action relies on switch 100 and col. 3, lines 46-67 and col. 4, lines 1-5 of Cloonan to teach a fixed forwarding rate. These portions of Cloonan teach packet switch 100, which includes interface cards 106, and output packet modules 104. Cloonan fails to teach or suggest that these output modules of the packet switches have a fixed forwarding rate. In contrast, Cloonan teaches that

[o]nce every ATM cell interval, the output packet module 104 extracts a cell from the front of each of the queues within each of its FIFOs 110 and transmits the cell out on the output port associated with the respective FIFO 110. The length of these FIFO queues can be selected to produce any desired queue overflow probability using formulae developed from queueing theory principles.

(Col. 2, lines 19-25). A transmission rate based on a probability fails to teach or suggest a fixed forwarding rate, as required by claim 1.

For at least these reasons Applicants respectfully maintain that claim 1 distinguishes over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 1 and all claims dependent thereon, be withdrawn.

Regarding claim 14, Applicants respectfully maintain that Cloonan, alone or in combination with other references of record, fails to teach or suggest

forwarding packets at a fixed rate on a first come first served basis from respective input ports through the switch to respective output ports,

as recited by claim 14. The Office Action relies on switch 100 and col. 3, lines 46-67 and col. 4, lines 1-5 of Cloonan to supply this teaching. These portions of Cloonan teach packet switch 100, which includes interface cards 106, and output packet modules 104. Cloonan fails to teach or suggest that these output modules of the packet switches have a fixed forwarding rate. In contrast, Cloonan teaches that

[o]nce every ATM cell interval, the output packet module 104 extracts a cell from the front of each of the queues within each of its FIFOs 110 and transmits the cell out on the output port associated with the respective FIFO 110. The length of these FIFO queues can be selected to produce any desired queue overflow probability using formulae developed from queueing theory principles.

(Col. 2, lines 19-25). A transmission rate based on a probability fails to teach or suggest a fixed forwarding rate, as required by claim 14. Thus, packet switch 100 of Cloonan fails to teach or suggest forwarding packets at a fixed rate on a first come first served basis from respective input ports through the switch to respective output ports, as required by claim 14. Accordingly, Applicants respectfully request that the rejection of claim 14 and all claims dependent thereon, be withdrawn.

Regarding claim 16, Applicants respectfully maintain that Cloonan, alone or in combination with other references of record, fails to teach or suggest that

low latency packets are transmitted on the switch,

as recited by claim 16. The Office Action states that "Cloonan teaches transmitting low latency packets (inherently part of the system, because Cloonan teaches designing the switch to satisfy packet delay characteristics 1:30-35)." While a teaching may be express or inherent, inherency is a stringent standard.

To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 U.S.P.Q.2D (BNA) 1746, 1749

(Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269, 20 U.S.P.Q.2D (BNA) at 1749 (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)).

See *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); MPEP § 2112. Applicants disagree that it is inherent for the system of Cloonan to practice the claim. For example, there is no teaching or suggestion that the switch of Cloonan must (or does) transmit low latency packets. To be inherent in transmitting low latency packets those functions must by necessity be performed in the switch of Cloonan. They are not. For at least this reason, Applicants respectfully maintain that claim 16 distinguishes over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 16 be withdrawn.

Regarding claim 18, Applicants respectfully maintain that Cloonan, alone or in combination with references of record, fails to teach or suggest

a low latency switched network including a first switch, the first switch being a buffer-less switch coupling the plurality of sending and receiving nodes, the buffer-less switch having a fixed forwarding delay for all packets sent from one of the sending nodes and successfully received by one of the receiving nodes,

as recited by claim 18. The Office Action relies on FIG. 1, and col. 1, lines 60-65 to supply this teaching. These portions of Cloonan teach packet switch 100, which includes interface cards 106, and output packet modules 104. Cloonan states that "[e]ach of the output packet modules 104 includes memory devices which are used to buffer the cells in order to alleviate problems associated with multiple cells destined for the same output line at the same time." (Col. 1, line 65-col. 2, line 2). The growable packet switches taught by Cloonan include output modules having a FIFO (col. 18, lines 1-2). Thus, packet switch 100 of Cloonan fails to teach or suggest a buffer-less switch, as required by claim 18.

The Office Action relies on switch 100 and col. 3, lines 46-67 and col. 4, lines 1-5 of Cloonan to teach a fixed forwarding delay. These portions of Cloonan teach packet

switch 100, which includes interface cards 106, and output packet modules 104. Cloonan fails to teach or suggest that these output modules of the packet switches have a fixed forwarding rate. In contrast, Cloonan teaches that

[o]nce every ATM cell interval, the output packet module 104 extracts a cell from the front of each of the queues within each of its FIFOs 110 and transmits the cell out on the output port associated with the respective FIFO 110. The length of these FIFO queues can be selected to produce any desired queue overflow probability using formulae developed from queueing theory principles.

(Col. 2, lines 19-25). A transmission rate based on a probability fails to teach or suggest a fixed forwarding rate, as required by claim 18.

In addition, the Office Action fails to point out where Cloonan teaches or suggests, and Applicants respectfully maintain that Cloonan fails to teach or suggest, that the network is a low latency switched network. For at least these reasons Applicants respectfully maintain that claim 18 distinguishes over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 18 and all claims dependent thereon, be withdrawn.

Regarding claim 30, Applicants respectfully maintain that Cloonan, alone or in combination with references of record, fails to teach or suggest

means for forwarding packets at a fixed rate on a first come first served basis from respective input ports through a switch to respective output ports,

as recited by claim 30. The Office Action relies on switch 100 and col. 3, lines 46-67 and col. 4, lines 1-5 of Cloonan to teach a fixed forwarding rate. These portions of Cloonan teach packet switch 100, which includes interface cards 106, and output packet modules 104. Cloonan fails to teach or suggest that these output modules of the packet switches have a fixed forwarding rate. In contrast, Cloonan teaches that

[o]nce every ATM cell interval, the output packet module 104 extracts a cell from the front of each of the queues within each of its FIFOs 110 and transmits the cell out on the output port associated with the respective FIFO 110. The length of these FIFO queues can be selected to produce

any desired queue overflow probability using formulae developed from queueing theory principles.

(Col. 2, lines 19-25). A transmission rate based on a probability fails to teach or suggest a fixed forwarding rate, as required by claim 30. For at least this reason Applicants respectfully maintain that claim 30 distinguishes over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 30 and all claims dependent thereon, be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 2, 3, 6, 9, 10, 15, and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 6,115,373 to Lea.

Regarding claims 2 and 6 the Office Action states that

Lea teaches each receiving node sending an ACK to a sending node at a predetermined time to sending a corresponding packet [sic] to indicate successful delivery/transmission of a packet (sending ACK from destination to the source, inherently at a predetermined time, because the ACK indicating the successful packet transmission should be received at the source to resume the transmission 5:50-62)

(emphasis added). While a teaching may be express or inherent, inherency is a stringent standard. See *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); MPEP § 2112. Applicants disagree that it is inherent for the system of Cloonan and Lea to practice the claims. For example, there is no teaching or suggestion that the receiving nodes of Cloonan and Lea must (or does) send an acknowledge at a predetermined time. To be inherent in sending an acknowledge at a predetermined time those functions must by necessity be performed in the switch of Lea. They are not. For at least this reason, Applicants respectfully maintain that claims 2 and 6 distinguish over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claims 2 and 6 be withdrawn.

Claims 3, 9, 10, and 15 depend from allowable claims and Applicants believe that claims 3, 9, 10, and 15 are allowable for at least this reason. Accordingly, Applicants respectfully request that the rejection of claims 3, 9, 10, and 15, be withdrawn.

Regarding claim 17, Applicants respectfully maintain that Cloonan, alone or in combination with Lea, fails to teach or suggest that

a sending node can positively determine after a fixed delay with respect to sending of the packet that a packet was successfully transmitted across the switched network

The Office Action states that

Lea teaches each receiving node sending an ACK to a sending node at a predetermined time to sending a corresponding packet [sic] to indicate successful delivery/transmission of a packet (sending ACK from destination to the source, inherently at a predetermined time, because the ACK indicating the successful packet transmission should be received at the source to resume the transmission 5:50-62)

(emphasis added). While a teaching may be express or inherent, inherency is a stringent standard. See *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); MPEP § 2112. Applicants disagree that it is inherent for the system of Cloonan and Lea to practice the claims. For example, there is no teaching or suggestion that the sending nodes of Cloonan and Lea must (or does) positively determine after a fixed delay with respect to sending of the packet that a packet was successfully transmitted across the switched network. To be inherent in positively determine after a fixed delay with respect to sending of the packet that a packet was successfully transmitted across the switched network, those functions must by necessity be performed in the switch of Cloonan and Lea. They are not. For at least this reason, Applicants respectfully maintain that claim 17 distinguishes over Cloonan and all references of record. Accordingly, Applicants respectfully request that the rejection of claim 17 be withdrawn.

Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 5,821,875 to Lee et al. Claim 19 depends from allowable claims and Applicants believe that claim 19 is allowable for at least this reason. Accordingly, Applicants respectfully request that the rejection of claim 19 be withdrawn.

Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan and Lea. The Office Action states that a receiving node that “sends a NACK at the

predetermined time to the sending node on detection of an error in the received packet checksum is well known in the art to indicate an error in the received packet and often retransmit [sic] the packet.” Applicants respectfully request that the Examiner provide references in support of these positions and explain how these references can be properly combined with other references of record to teach Applicants’ claimed method revealed in claims 4 and 5.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan. The Office Action states that a receiving node that “sends a NACK to the sending node on detection of a buffer overflow is well known in the art to indicate a problem at the receive side and often requires the source to reduce the transmission rate.” Applicants respectfully request that the Examiner provide references in support of these positions and explain how these references can be properly combined with other references of record to teach Applicants’ claimed method revealed in claim 12.

Claims 13, 21, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan in view of U.S. Patent No. 3,676,846 to Busch. Regarding claim 13, the Office Action states that the “sending computer polling the status register” is inherently part of the system of Busch because Busch teaches storing acknowledgements for the transmitted data blocks and rewriting the data for retransmission in the send register. While a teaching may be express or inherent, inherency is a stringent standard. See *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); MPEP § 2112. Applicants disagree that it is inherent for the system of Busch to practice the claim. For example, there is no teaching or suggestion that the sending node of Busch must (or does) poll a status register. To be inherent in polling a status register those functions must by necessity be performed in the system of Busch. They are not. Accordingly, Applicants respectfully request that the rejection of claim 13 be withdrawn.

Regarding claims 21 and 22, Applicants believe that these claims depend from allowable base claims and are allowable for at least this reason. Accordingly, Applicants respectfully request that the rejection of claims 21 and 22, be withdrawn.

Regarding claim 23, the Office Action states that “sending an NACK indicating a type of failure and saving it is well known in the art to help the operator to determine the cause of the transmission problem.” Applicants respectfully request that the Examiner provide references in

support of these positions and explain how these references can be properly combined with other references of record to teach Applicants' claimed computing system revealed in claim 23.


Additional Remarks

Applicants note that the Office Action has inadvertently omitted the basis for rejecting claims 24 and 28. Claim 9 is similar to claim 28 and Applicants presume that the rejection of claim 28 has the same basis for rejection as claim 9. Applicants respectfully request the Examiner to provide the basis for rejecting claim 24 in the next communication from the Office.

Allowable Subject Matter

Claim 20 is objected to as being dependent upon a rejected base claim. Applicants appreciate the indication of allowable subject matter in claim 20. Applicants believe that claim 20 depends from allowable base claims and is allowable for at least this reason.

In summary, claims 1-30 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

<u>CERTIFICATE OF MAILING OR TRANSMISSION</u>	
I hereby certify that, on the date shown below, this correspondence is being	
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 Nicole T. Cave	2/8/05 Date

Respectfully submitted,



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